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SCIENCE ABSTRACTS, SERIES A

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PART I SUBJECT INDEX NUMBER

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SUBJECT INDEX—PART I

INTRODUCTION

The entries in this index refer to the abstracts by their serial number, not by the page number. The entries are grouped under headings (printed in bold type, e.g. "**Algebra**"). If a heading for a particular subject does not appear, the subject may be in the form of a cross-reference to another heading, perhaps of a more general nature. Many of the headings are subdivided by the use of subheadings, which are indented (i.e. printed slightly to the right) and commence with a small letter.

The information contained in the subject index is illustrated by following example:

main heading
Crystal electron states 'See also' crossreference to another heading
See also Colour centres
keyword
(file word)
helicon relaxation of electron spins 0-17901
polarons
subheading modifier line (entry) abstract number in 1970

Associated with the subheading "polarons" is a 'See' crossreference as follows:

Polarons *See Crystal electron states/polarons*

This means that for papers on "polarons" the reader should consult the subheading "polarons" of "Crystal electron states" as displayed above.

ARRANGEMENT OF HEADINGS AND SUBHEADINGS

The headings and crossreferences are arranged throughout the index in alphabetical order according to the "word by word" system. The subheadings are themselves arranged in alphabetical order under their respective headings.

ARRANGEMENT OF ENTRIES UNDER HEADINGS

Entries are arranged in four distinct groups as follows:

First group: arabic numerals
Second group: English alphabet (A-Z), roman numerals, Greek alphabet (excluding elementary particles)
Third group: elementary particle symbols i.e. Greek and English alphabet e.g. μ (muon), p (proton)
Fourth group: chemical formulae (including entries beginning with nuclei, e.g. ^{57}Fe)

CLASSIFIED LIST OF SUBJECT INDEX HEADINGS

In this list the headings are not arranged in alphabetical order, but are grouped into sections by subject, on the same basis as the arrangement in the fortnightly issues of Physics Abstracts. By using this list the reader can quickly determine all the headings which are appropriate to his subject, and then they can easily be found in the main index in their alphabetical position.

HEADINGS WITH NO ENTRIES

All the headings in current use in a given year are printed, even those for which there are no abstracts to be recorded. The latter are followed by the announcement "No entries". This confirms that these headings have not been dropped from the index, and entries may appear under them in subsequent issues.

NUCLEI, ELEMENTS, COMPOUNDS AND OTHER SUBSTANCES

Abstracts on nuclei whose mass number (or mass number range) is given are listed under a set of headings which begin "**Nuclei with....**" e.g. Nuclei with $6 \leqslant A \leqslant 19$ where A is the mass number.

The names of elements, their compounds, a few compounds of special interest (e.g. "**Ruby**", "**Water**") and a few common materials (e.g. "**Wood**", "**Paper**") are included as headings or sub-headings (e.g. "**barium titanate**" under "**Barium compounds**"). Under these, as well as under the appropriate "subject" headings, are listed any abstracts which contain significant physical information about the element, compound or substance named.

Inorganic compounds of the elements are listed under the first element in the chemical formula, and all the compounds of a given element are grouped under a single heading (e.g. "**Sodium compounds**"). Alloys are listed under compounds of the named constituents e.g. Au-Ag alloys under "**Gold compounds**" and "**Silver compounds**". There are also four special headings for the common alloys: "**Aluminium alloys**", "**Copper alloys**", **Iron alloys**", "**Nickel alloys**". Organic compounds are grouped under "**Organic compounds**", "**Polymers**", "**Plastics**" and under special substance headings such as "**Paper**", "**Proteins**", etc.; all the latter are listed at the end of the classified list of headings. Metallic co-ordination compounds when regarded as inorganic are listed under the appropriate metallic compound heading (not under organic compounds) e.g. Ni complex, bis(dimethylglyoximato)nickel(II) under "**Nickel compounds**"

CLASSIFIED LIST OF SUBJECT INDEX HEADINGS

The headings are grouped into sections on the same basis as the arrangement of the abstracts in the fortnightly issues of Physics Abstracts. A summary of the layout of these sections (these are actually further subdivided), is given below. Each section lists the headings which concern its subject and it follows that many of the headings are listed in several places.

SUBJECT SECTIONS

01.00	GENERAL
02.00	MATHEMATICAL PHYSICS
03.00	MECHANICS. ELASTICITY. VIBRATION.ACOUSTICS
04.00	HEAT. THERMODYNAMICS
05.00	ELECTROMAGNETISM
06.00	ELECTRODYNAMICS & PARTICLE OPTICS
07.00	QUANTUM ELECTRONICS. QUANTUM OPTICS
08.00	OPTICS
09.00	QUANTUM FIELD THEORY
10.00	ELEMENTARY PARTICLES
11.00	ELEMENTARY PARTICLE & NUCLEAR MEASUREMENT
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18.00	SOLID-STATE SPECTROSCOPY & OPTICAL PROPERTIES
19.00	PHYSICAL CHEMISTRY
20.00	GEOPHYSICS
21.00	ASTROPHYSICS
22.00	BIOPHYSICS
23.00	LABORATORY & EXPERIMENTAL TECHNIQUES

01.00 GENERAL

- Biographies
- Collections of physical data
- History
- Laboratories
- Laboratory apparatus and technique
- Nomenclature and symbols
- Physics
- Physics fundamentals
- Reviews

01.10 EDUCATION

- Biographies
- History
- Laboratories
- Laboratory apparatus and technique
- Physics
- Physics fundamentals
- Reviews
- Teaching demonstrations

01.20 UNITS. MEASUREMENT AND METROLOGY

- Acceleration measurement
- Anemometers
- Angle measurement
- Angular velocity measurement
- Area measurement
- Balances
- Constants
- Density measurement
- Dimensions
- Force measurement
- Instruments
- Interferometry
- Length measurement
- Manometers
- Measurement errors
- Mechanical measurement
- Micrometry
- Nomenclature and symbols
- Particle size
- Pressure measurement
- Recording
- Standards
- Strain gauges
- Stroboscopes
- Surface measurement
- Thickness measurement
- Time interval measurement
- Time measurement
- Units
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- Velocity measurement
- Volume measurement

02.00 MATHEMATICAL PHYSICS

- Algebra
- Differential equations
- Equations
- Field theory, classical
- Fluctuations
- Fourier analysis
- Functions
- Geometry
- Green's function methods
- Group theory
- Hysteresis
- Information theory
- Integral equations
- Integrals
- Mathematics
- Matrices
- Probability
- Radiation
- Relaxation
- Series
- Space-time configurations
- Statistical analysis/applications
- Tensors
- Transformations, mathematical
- Vectors
- Waves

02.10 GRAVITATION AND RELATIVITY

- Gravitation
- Gravitational waves
- Relativity/
  - general
  - special
  - unified field theories
- Space-time configurations

02.20 QUANTUM THEORY

- Collision processes
- Dispersion relations
- Indeterminacy
- Parity
- Quantum electrodynamics
- Quantum theory/
  - application methods
  - quantization
  - wave equations
- Scattering

02.30 STATISTICAL PHYSICS

- Brownian motion
- Electron gas
- Fluctuations
- Hysteresis
- Information theory
- Kinetic theory
- Lattices, theory and statistics
- Many-body problems
- Probability
- Quantum fluids/
  - boson systems
  - fermion systems
- Quantum theory
- Radiation
- Radiative transfer
- Random processes
- Relaxation
- Statistical analysis/
  - applications
- Statistical mechanics/
  - quantum
- Thermodynamics
- Transport processes

02.40 MATHEMATICAL METHODS

- Calculation
- Graphs
- Nomograms
- Statistical analysis
  - applications
- Tables, mathematical

03.00 MECHANICS. ELASTICITY. VIBRATION. ACOUSTICS

- Oscillations
- Vibrations
- Waves

03.10 MECHANICS

- Ballistics
- Centrifuges
- Dynamics
- Friction
- Gravitation
- Gyroscopes
- Impact
- Kinematics
- Mechanics
- Pendulums
- Pressure
- Rockets
- Rotating bodies
- Torsion
- Velocity

03.15 RHEOLOGY, ELASTICITY AND PLASTICITY

- Bending
- Compressibility
- Damping
- Deformation
- Elastic deformation
- Elasticity
- Photoelasticity
- Plastic deformation
- Plasticity
- Relaxation
- Rheology
- Stress analysis
- Stresses, internal
- Thermoelasticity
- Viscoelasticity

03.30 VIBRATIONS AND ELASTIC WAVES

- Damping
- Elastic waves
- Magnetoelastic waves
- Membranes
- Oscillations
- Piezoelectric oscillations
- Relaxation
- Resonators
- Seismic waves
- Shock waves/
  - effects
- Vibrating bodies
- Vibrations/
  - excitation
  - measurement
- Waves

03.40 ACOUSTICS

- Absorption/
  - acoustic waves
  - acoustic waves, ultrasonic
- Acoustic analysis
- Acoustic generators
- Acoustic impedance
- Acoustic radiators
- Acoustic receivers
- Acoustic resonators
- Acoustic streaming
- Acoustic wave propagation/
  - ultrasonic
- Acoustic waves/
  - effects
- Acoustical laboratories
- Acoustical measurement
- Acoustics/
  - musical
- Acoustoelectric effects
- Architectural acoustics
- Atmospheric acoustics
- Biological effects of radiations
- Chemical effects of radiations/
  - acoustic waves
- Diffraction/
  - acoustic waves
  - acoustic waves, ultrasonic
- Diffusion/
  - acoustic waves
- Dispersion, acoustic/
  - ultrasonic
- Doppler effect
- Echo
- Helium/
  - liquid, sound propagation
- Holography
- Intensity measurement/
  - acoustics
- Interference/
  - acoustic waves
- Interferometers/
  - acoustic waves
- Interferometry/
  - acoustic waves
- Magnetoacoustic effects
- Microphones
- Musical instruments
- Noise/
  - acoustic
- Noise abatement
- Physical effects of radiations
- Radiation pressure
- Recording
- Reflection/
  - acoustic waves
  - acoustic waves, ultrasonic
- Refraction/
  - acoustic waves
  - acoustic waves, ultrasonic
- Reverberation
- Scattering/
  - acoustic waves
  - acoustic waves, ultrasonic
- Schlieren systems
- Sound ranging
- Sound reproduction
- Speech
- Stroboscopes
- Transducers
- Transmission/
  - acoustic waves
  - acoustic waves, ultrasonic
- Ultrasonics
- Velocity/
  - acoustic waves
  - acoustic waves, ultrasonic
- Velocity measurement/
  - acoustic waves
  - acoustic waves, ultrasonic

03.50 SHOCK WAVES

- Detonation
- Explosions/
  - nuclear
- Schlieren systems
- Shock tubes
- Shock waves/
  - effects
- Supersonic flow

04.00 HEAT AND THERMODYNAMICS

- Bolometers
- Calorimeters
- Calorimetry
- Combustion
- Conductivity, thermal
- Convection
- Cooling
- Emissivity
- Entropy/
  - properties of substances
- Equations of state/
  - gases
  - liquids
  - solids
- Flames
- Heat
- Heat conduction
- Heat transfer
- Heat treatment
- Heating
- High-temperature phenomena and effects
- Joule-Thomson effect
- Latent heat
- Pyrometers
- Radiation/
  - heat
- Radiation detectors
- Radiation pressure
- Radiation transfer
- Specific heat
- Temperature
- Temperature distribution
- Temperature measurement/
  - spectral methods
- Thermal expansion
- Thermal measurement
- Thermocouples
- Thermodynamic properties
- Thermodynamics/
  - applications
- Thermometers/
  - resistance
- Thermostats

05.00 ELECTROMAGNETISM

- Eddy-currents
- Electromagnetism
- Electromagnetic fields
- Electromotive force
- Inductance

05.10 ELECTROMAGNETIC WAVES AND OSCILLATIONS

- Absorption/
  - electromagnetic waves
- Amplifiers
- Diffraction/
  - electromagnetic waves
- Diffusion/
  - electromagnetic waves
- Doppler effect
- Electromagnetic oscillations
- Electromagnetic wave propagation/
  - atmosphere
  - ionosphere
  - guided waves
- Electromagnetic waves/
  - radiators
- Interference/
  - electromagnetic waves
- Interferometers/
  - electromagnetic waves
- Interferometry/
  - electromagnetic waves
- Light/
  - electromagnetic theory
- Microwave techniques and devices
- Plasma/
  - electromagnetic wave propagation
- Radiation
- Reflection/
  - electromagnetic waves
- Refraction/
  - electromagnetic waves
- Scattering/
  - electromagnetic waves

05.20 RADIOFREQUENCY SPECTROSCOPY. MAGNETIC RESONANCES

- Antiferromagnetic resonance
- Cyclotron resonance
- Ferrimagnetic resonance
- Ferromagnetic relaxation
- Ferromagnetic resonance
- Magnetic resonance and relaxation
- Nuclear magnetic resonance and relaxation/
  - measurement
- Nuclear quadrupole resonance
- Paramagnetic resonance and relaxation/
  - measurement
- Spectra
- Spectrometers, radio frequency
- Spectroscopy, radio frequency

05.30 ELECTRICAL QUANTITIES AND THEIR MEASUREMENT. CIRCUITS

- Acoustoelectric effects
- Amplifiers
- Breakdown, electric
- Circuits
- Conductivity, electrical/
    - measurement
- Contacts, electrical
- Counting circuits
- Current, electrical
- Dielectric devices
- Dielectric measurement
- Dielectric phenomena
- Eddy-currents
- Electrets
- Electric charge
- Electric fields/
    - effects
- Electric strength
- Electrical machines
- Electrical measurement
- Electrical properties of substances
- Electrokinetic effects
- Electroluminescence
- Electromotive force
- Electron gas
- Electrons
- Electro-optical effects
- Electrophoresis
- Electrostatics
- Electrostriction
- Ferroelectric phenomena
- Fluctuations
- Hall effect
- High-voltage techniques
- Hysteresis
- Image convertors and amplifiers
- Inductance
- Magnetoelectric effects
- Magnetoresistance
- Noise, electrical
- Oscillators
- Photoconductivity
- Photoelectricity
- Photoelectromagnetic effects
- Photovoltaic effects
- Piezoelectric oscillations
- Piezoelectricity
- Piezoresistance
- Plasma/
    - diagnostics
- Pyroelectricity
- Rectifiers
- Relaxation
- Semiconductors
- Skin effect
- Space charge
- Superconductivity
- Thermocouples
- Thermoelectricity
- Triboelectricity

05.35 DIRECT CONVERSION

- Electricity, direct conversion/
    - fuel cells
    - magnetohydrodynamics
    - solar cells
    - thermionic

05.40 MAGNETISM

- Antiferromagnetism
- Compasses
- de Haas-van Alphen effect
- Diamagnetism
- Ferrimagnetism
- Ferromagnetism/
    - spin-wave theory
- Films, solid/
    - magnetic properties
- Gyromagnetic effect
- Gyromagnetic ratio
- Hall effect
- Magnetic devices
- Magnetic field measurement
- Magnetic fields/
    - effects
- Magnetic measurement
- Magnetic resonance and relaxation
- Magnetism
- Magnetization process
- Magnetization state
- Magnetoacoustic effects
- Magnetoelectric effects
- Magnetomechanical effects
- Magneto-optical effects
- Magnetoresistance
- Magnetostriction
- Magnetothermal effects
- Magnets
- Paramagnetism
- Storage devices

06.00 ELECTRODYNAMICS AND PARTICLE OPTICS

- Electrodynamics
- Energy loss of particles
- Particle beams
- Particle optics
- Particle velocity analysis
- Scattering, particles

06.10 ELECTRON BEAMS, ELECTRON OPTICS AND TUBES

- Electron beams/
    - effects
- Electron diffraction
- Electron gas
- Electron lenses/
    - electrostatic
    - magnetic
- Electron microscopes
- Electron microscopy
- Electron optics
- Electron tubes
- Electrons/
    - absorption
    - ionization
    - radiation
    - scattering
- Fluctuations
- Gas-discharge tubes
- Image convertors and amplifiers
- Noise, electrical
- Photomultipliers
- Space charge

06.20 ION BEAMS, ION OPTICS AND SOURCES

- Ion beams/
    - effects
- Ion microscopes
- Ion optics
- Ion sources
- Ion velocity
- Ions/
    - recombination
    - scattering
- Sputtering

07.00 QUANTUM ELECTRONICS AND QUANTUM OPTICS

- Light/
    - coherence
- Optical pumping
- Photons
- Quantum optics

07.10 MASERS

- Amplifiers
- Masers
- Optical pumping

07.20 LASERS

- Amplifiers
- Lasers
- Light/
    - coherence
- Optical pumping
- Resonators

07.23 Gas and Liquid Lasers

- Amplifiers
- Lasers/
    - gaseous
    - liquid
- Light/
    - coherence
- Optical pumping

07.25 Solid Lasers

- Amplifiers
- Lasers/
  - semiconductor
  - solid
- Light/
  - coherence
- Optical pumping

07.27 Laser Beam Optics

- Holography
- Laser beams/
  - applications
  - effects
- Light/
  - coherence
  - modulation

08.00 OPTICS

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- Electro-optical effects
- Light/
  - electromagnetic theory
  - modulation
- Light sources
- Nonlinear optics
- Optics
- Photons
- Photophoresis
- Radiation
- Radiation pressure
- Velocity/
  - light
- Velocity measurement/
  - light

08.10 GEOMETRICAL OPTICS

- Aberrations, optical
- Dispersion, optical
- Lenses/
  - aspherical
  - photographic
- Mirrors
- Optical images
- Optical systems
- Optics/
  - geometrical
- Prisms, optical
- Reflection/
  - light
- Refraction/
  - light
- Refractive index/
  - light
- Resolving power, optics
- Schlieren systems

08.20 PHYSICAL OPTICS

- Absorption/
  - light
- Diffraction/
  - light
- Diffraction gratings
- Diffusion/
  - light
- Dispersion, optical
- Doppler effect
- Double refraction/
  - flow
  - mechanical
- Electro-optical effects
- Filters, optical
- Holography
- Interference/
  - light
- Interferometers/
  - light
- Interferometry/
  - light
- Magneto-optical effects
- Optical constants
- Optical films
- Optical pumping
- Optical rotation
- Photoelasticity
- Pleochroism
- Polarimeters
- Polarized light
- Reflection/
  - light
- Reflectivity
- Refraction/
  - light
- Refractive index/
  - light
- Scattering/
  - light
- Transmission/
  - light
- Transparency

08.30 PHOTOMETRY. CALORIMETRY

- Bolometers
- Brightness
- Colorimetry
- Colour
- Densitometry
- Emissivity
- Illumination
- Photometers
- Photometry/
  - light sources
- Pyrometers
- Radiation detectors

08.40 INSTRUMENTAL OPTICS

- Abberations, optical
- Dispersion, optical
- Fibres/
  - optical
- Films/
  - liquid
- Films, solid/
  - optical properties
- Filters, optical
- Glass
- Image convertors and amplifiers
- Lasers/
  - gaseous
  - solid
- Lenses/
  - aspherical
  - photographic
- Light sources
- Luminescent devices
- Microscopes
- Microscopy
- Mirrors
- Optical constants
- Optical images
- Optical instrument testing
- Optical instruments
- Optical materials
- Optical systems
- Prisms, optical
- Projectors, optical
- Quartz
- Reflection/
  - light
- Refraction/
  - light
- Refractive index/
  - light
- Refractive index measurement
- Refractometers
- Resolving power, optics
- Schlieren systems
- Stroboscopes
- Telescopes

08.45 Spectroscopy

- Astronomical spectra
- Atmospheric spectra
- Monochromators
- Spectral line breadth
- Spectrochemical analysis
- Spectrometers/
  - accessories
- Spectrophotometers
- Spectrophotometry
- Spectroscopy/
  - light sources
- Stark effect
- Temperature measurement/
  - spectral methods
- Zeeman effect

08.50 PHOTOGRAPHY

- Cameras
- Cinematography
- Densitometry
- Lenses/
  - photographic
- Light sources
- Nuclear track emulsions
- Photographic materials/
  - sensitivity
- Photographic process/
  - development
- Photography/
  - applications
  - colour
  - high-speed
- Radiography

09.00 QUANTUM FIELD THEORY

- Current algebra
- Dispersion relations
- Field theory, quantum/
    - interactions
    - interactions, strong
    - interactions, weak
    - meson field
    - quantization
    - scattering
- Nuclear forces
- Parity
- Quantum electrodynamics
- Quantum theory/
    - application methods
    - quantization
    - wave equations
- S-matrix theory
- Scattering

10.00 ELEMENTARY PARTICLES

- Bosons
- Elementary particles
- Fermions
- Gravitons
- Parity
- Energy loss of particles
- Particle velocity analysis
- Quarks
- Strange particles
- Synchrotron radiation

10.10 ELEMENTARY PARTICLE THEORY

- Bosons
- Current algebra
- Dispersion relations
- Elementary particles/
    - interactions
    - interactions, strong
    - interactions, weak
    - scattering
    - symmetry
    - theory
- Fermions
- Nuclear forces
- Parity
- S-matrix theory
- Strange particles

10.20 PHOTONS, GAMMA-RAYS AND X-RAYS

- Bremsstrahlung
- Cherenkov radiation
- Compton effect
- Gamma-ray spectrometers
- Gamma-rays/
    - absorption
    - angular distribution
    - detection, measurement
    - effects
    - scattering
- Mössbauer effect
- Photons/
    - interactions
    - polarization
    - scattering
- Synchrotron radiation
- X-ray absorption
- X-ray diffraction
- X-ray measurement
- X-ray reflection
- X-ray scattering
- X-rays/
    - effects

10.30 LEPTONS

- Leptons

10.33 Neutrinos

- Neutrinos and antineutrinos

10.35 Electrons

- Beta-ray spectra/
    - conversion electrons
- Beta-ray spectrometers
- Beta-rays/
    - absorption
    - angular distribution
    - detection, measurement
    - effects
    - polarization
    - scattering
- Electron pairs/
    - annihilation
    - production
- Electron theory
- Electrons/
    - absorption
    - interactions
    - ionization
    - radiation
    - scattering
    - scattering, electron-proton
- Positronium
- Positrons
- Synchrotron radiation

10.37 Muons

- Muons/
    - capture
    - decay
    - detection, measurement
- Muons/
    - interactions
    - production
    - scattering
- Muonium

10.40 HADRONS

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    - current
    - decay
- Quarks

10.41 Hadron interactions

- Hadrons/
    - interactions

10.42 Hadron scattering

- Hadrons/
    - scattering

10.45 Mesons

- Mesons/
    - absorption
    - capture
    - decay
    - detection, measurement
    - effects
- Mesons/
    - interactions
    - magnetic moment
    - mass
    - production
    - scattering
    - spin and parity

10.46 Kaons

- decay
- interactions
- production
- scattering

10.47 Pions

- Pions/
    - decay
    - interactions
    - interactions, pion-nucleon
    - interactions, pion-pion
    - interactions, pion-proton
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    - production
    - scattering
    - scattering, pion-nucleon
    - scattering, pion-pion
    - scattering, pion-proton

10.48 Meson Resonances

- Mesons/
    - resonances

10.51 Baryons

- Baryons/
    - interactions
    - scattering

10.52 Nucleons

- Nuclear forces
- Nucleons and antinucleons/
    - antinucleons
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    - scattering
    - scattering, nucleon-nucleon

10.53 Protons

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- Protons and antiprotons/
  - absorption
  - angular distribution
  - antiprotons
  - detection, measurement
  - effects
  - interactions
  - interactions, proton-proton
  - magnetic moment
  - polarization
  - production
  - scattering
  - scattering, proton-deuteron
  - scattering, proton-proton

10.54 Neutrons

- Neutron diffraction
- Neutron spectra
- Neutron spectrometers
- Neutrons and antineutrons/
  - absorption
  - angular distribution
  - detection, measurement
  - diffusion
  - effects
  - interactions
  - moderation
  - polarization
  - production
  - reflection
  - scattering
  - scattering, neutron-proton

10.56 Hyperons

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- Hyperons/
  - absorption
  - capture
  - decay
  - detection, measurement
  - effects
  - interactions
  - magnetic moment
  - mass
  - production
  - resonances
  - scattering
  - spin and parity
- Strange particles

10.58 Baryon Resonances

- Baryons/
  - resonances
- Hyperons/
  - resonances
- Nucleons

10.60 COMPOSITE PARTICLES

- Composite particles

10.63 Deuterons

- Deuterons/
  - effects
  - interactions
  - photodisintegration
  - polarization
  - scattering

10.65 Tritons

- Tritons/
  - interactions
  - scattering

10.67 Alpha-particles and He^3

- Alpha-particle spectrometers
- Alpha-particles/
  - absorption
  - angular distribution
  - detection, measurement
  - effects
  - interactions
  - scattering
- Helium-3
  - interactions
  - scattering

10.70 COSMIC RAYS

- Cosmic rays/
  - absorption
  - apparatus
  - composition
    - alpha-particles and helium nuclei
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    - electrons
    - mesons
    - muons
    - neutrinos
    - neutrons
    - nucleons
    - photons
    - protons
    - X-rays
  - effects and interactions
  - origin
  - primary
  - showers and bursts
  - variation

11.00 ELEMENTARY PARTICLE AND NUCLEAR MEASUREMENT

11.10 APPARATUS. DETECTORS AND DETECTOR CIRCUITS

- Alpha-particle spectrometers
- Amplifiers
- Beta-ray spectrometers
- Counters/
  - accessories
  - Cherenkov
  - crystal
  - Geiger
  - operation technique
  - proportional
  - scintillation
  - semiconductor
  - spark
  - statistical analysis
- Counting circuits
- Dosimetry
- Gamma-ray spectrometers
- Ionization chambers
- Neutron spectrometers
- Nuclear bombardment targets
- Particle accelerators
- Particle detectors
- Particle optics
- Particle spectrometers
- Particle velocity analysis
- Photomultipliers
- Radioactivity measurement/
  - apparatus

11.15 Track Visualization

- Bubble chambers
- Cloud chambers
- Energy loss of particles
- Luminescence chambers
- Nuclear track emulsions
- Particle tracks
- Particle track visualization
- Spark chambers

11.20 PARTICLE ACCELERATORS

- High-voltage techniques
- Ion sources
- Particle accelerators/
  - accessories
  - betatrons
  - cyclotrons
  - linear
  - synchrotrons

12.00 NUCLEAR PHYSICS

Nuclear physics

12.10 NUCLEAR STRUCTURE AND ENERGY LEVELS

- Beta-ray spectra/
  - conversion electrons
- Gamma-ray spectra
- Gamma-rays/
  - angular distribution
  - internal conversion
- Gyromagnetic ratio
- Hypernuclei
- Mössbauer effect
- Nuclear excitation
- Nuclear forces
- Nuclear isomerism
- Nuclear magnetic resonance and relaxation
- Nuclear polarization
- Nuclei with $A \leqslant 5$
- Nuclei with $6 \leqslant A \leqslant 19$
- Nuclei with $20 \leqslant A \leqslant 49$
- Nuclei with $50 \leqslant A \leqslant 89$
- Nuclei with $90 \leqslant A \leqslant 149$
- Nuclei with $150 \leqslant A$
- Nucleus/
  - electric moment
  - energy level transitions
  - energy levels
  - magnetic moment
  - models
  - size
  - spin and parity
  - theory

12.20 NUCLEAR DECAY AND RADIOACTIVITY

- Alpha-particles
- Alpha-particle spectra
- Alpha-particle spectrometers
- Alpha-particles/
  - absorption
  - angular distribution
  - detection, measurement
  - effects
  - scattering
- Beta-decay theory
- Beta-ray spectra/
  - conversion electrons
- Beta-ray spectrometers
- Beta-rays/
  - absorption
  - angular distribution
  - detection, measurement
  - effects
  - polarization
  - scattering
- Biological effects of radiations
- Chemical effects of radiations/
  - ionizing radiations
- Dosimetry
- Fallout
- Gamma-ray spectra
- Gamma-ray spectrometers
- Gamma-rays/
  - absorption
  - angular distribution
  - detection, measurement
  - effects
  - internal conversion
  - scattering
- Nuclear decay theory
- Nuclear bombardment targets
- Physical effects of radiations
- Radiation monitoring
- Radiation protection
- Radioactive dating
- Radioactive tracers
- Radioactivity/
  - decay periods
  - decay schemes
  - electron capture
- Radioactivity measurement/
  - apparatus
- Radiochemistry

12.30 NUCLEAR REACTIONS AND SCATTERING

- Chemical analysis/
  - by nuclear reactions
- Collision processes
- Nuclear bombardment targets
- Nuclear excitation
- Nuclear forces
- Nuclear reactions and scattering/
  - chemical effects
  - high energy $\geqslant$ 1GeV
- Nuclear reactions and scattering due to/
  - alpha-particles
  - cosmic rays
  - deuterons
  - electrons
  - helium-3
  - hyperons
  - mesons
  - muons
  - neutrinos
  - neutrons
  - nuclei of $Z > 2$
  - nucleons
  - photons
  - protons
  - tritons
- Nuclear spallation
- Nuclei with $A \leqslant 5$
- Nuclei with $6 \leqslant A \leqslant 19$
- Nuclei with $20 \leqslant A \leqslant 49$
- Nuclei with $50 \leqslant A \leqslant 89$
- Nuclei with $90 \leqslant A \leqslant 149$
- Nuclei with $150 \leqslant A$
- Radiation monitoring
- Radiation protection
- Scattering, particles

12.39 Nuclear fission and fusion

- Explosions/
  - nuclear
- Nuclear fission/
  - products
  - uranium
- Nuclear fusion
- Nucleons
- Plasma
- Thermonuclear reactions

12.40 NUCLEAR POWER STUDIES

12.43 Neutron Transport Theory

- Neutron transport theory
- Neutrons and antineutrons/
  - absorption
  - angular distribution
  - detection measurement
  - diffusion
  - effects
  - interactions
  - moderation
  - polarization
  - production
  - reflection
  - scattering
- Nuclear fission/
  - products
  - uranium
- Nuclear fusion
- Nuclear reactions
- Thermonuclear reactions

12.47 Nuclear Reactors

- Biological effects of radiations
- Chemical analysis/
  - by nuclear reactions
- Chemical effects of radiations/
  - ionizing radiations
- Dosimetry
- Nuclear fission/
  - products
  - uranium
- Nuclear fusion
- Nuclear reactions/
  - chemical effects
- Nuclear reactors, fission/
  - materials
  - operation
  - theory
- Nuclear reactors, fusion
- Physical effects of radiations
- Plasma/
  - devices
- Radiation monitoring
- Radiation protection
- Radiochemistry
- Thermonuclear reactions

13.00 ATOMIC AND MOLECULAR PHYSICS

Collision processes
Orbital calculation methods
Quantum theory

13.10 MASS SPECTROMETERS

- Mass spectra
- Mass spectrometers/
  - accessories
  - applications

13.20 ATOMS

- Atomic beams
- Atomic mass and weight
- Atoms
  - electron scattering
  - excitation
  - magnetic moment
  - structure
- Charge exchange
- Collision processes/
  - atoms
- Electron emission
  - photoelectric
- Elements
  - origin
  - relative abundances
- Exchange interactions
- Gyromagnetic ratio
- Helium/
  - gas
- Hydrogen/
  - ions
  - neutral atoms
- Ionization potential
- Luminescence
  - gases
- Optical pumping
- Orbital calculation methods
- Periodic system
- Spectra
  - atoms
- Spectral line breadth
- Stark effect
- X-ray spectra
  - absorption
  - emission
- Zeeman effect

13.25 Isotopes

- Isotope effects
- Isotope exchanges
- Isotope separation
- Isotopes
  - detection
  - relative abundances
- Mass spectra
- Mass spectrometers/
  - applications
- Radioactive dating
- Radioactive tracers
- Radiochemistry
- Tracers

13.27 Mesic and Muonic Atoms

- Atoms, mesic and muonic

13.30 MOLECULES

- Bonds
- Chemical shift
- Chemical structure
- Exchange interactions
- Isomerism
- Jahn-Teller effect
- Luminescence/
  - gases
- Magnetic resonance and relaxation
- Molecular weight
- Molecules/
  - configuration and dimensions
    - inorganic
    - organic
  - excitation
  - internal mechanics
  - electronic structure
  - electronic structure, inorganic
  - electronic structure, organic
  - nuclear coupling
  - relaxation
  - rotation
  - vibration
  - moments
- Nuclear magnetic resonance and relaxation
- Nuclear quadrupole resonance
- Optical pumping
- Orbital calculation methods
- Paramagnetic resonance and relaxation
- Scattering/
  - light
  - light, Brillouin spectra
  - light, Raman spectra
  - light, Raman spectra, inorganic
  - light, Raman spectra, organic
- Spectra/
  - inorganic molecules
    - diatomic
    - diatomic, radiofrequency
    - polyatomic
    - polyatomic, radio-frequency
  - inorganic liquids and solutions
  - inorganic solids
    - radiofrequency
  - molecules
  - organic molecules and substances
    - infrared
    - radiofrequency
- Spectral line breadth
- Stark effect
- Valency
- Zeeman effect

13.34 Dissociation. Free radicals

- Association/
  - gases
- Free radicals
- Heat of dissociation
- Molecules/
  - dissociation
  - dissociation energies

13.35 Macromolecules

- Association
- Heat of formation
- Isomerism
- Macromolecules
- Molecules/
  - configuration and dimensions, macromolecules
- Polymers
- Proteins

13.36 Mesic and Muonic Molecules

- Molecules, mesic and muonic

13.37 Intermolecular mechanics

- Charge exchange
- Collision processes/
  - molecules
- Molecular beams
- Molecules/
  - intermolecular mechanics

14.00 FLUIDS

- Boundary layers
- Flow/
  - two-phase
- Fluids
- Hydrodynamics
- Hydrostatics
- Oscillations
- Turbulence
- Viscosity
- Vortices
- Waves

14.10 MAGNETOHYDRODYNAMICS

- Magnetohydrodynamics
- Shock waves/
  - effects
- Turbulence

14.20 PLASMA

- Discharges, electric/
  - glows
  - high-frequency
- Nuclear fusion
- Nuclear reactors, fusion
- Plasma/
  - collison processes
  - electromagnetic waves
  - magnetohydrodynamics
  - production
  - shock waves
- Shock waves/
  - effects
- Space charge/
  - gas
- Thermonuclear reactions

14.24 Plasma Confinement, Devices and Measurements

- Plasma/
  - confinement
  - devices
  - diagnostics

14.26 Plasma Oscillations and Stability

- Plasma/
  - magnetohydrodynamics
  - oscillations
  - stability

14.30 IONIZATION

- Charge exchange
- Dissociation
- Ion velocity
- Ionization/
  - gases
- Ionization potential
- Ionization, surface
- Ions/
  - recombination
  - scattering
- Photoionization/
  - gases
- Shock waves/
  - effects
- Space charge/
  - gas

14.40 ELECTRIC DISCHARGES

- Arcs, electric
- Breakdown, electric/
  - gases
- Corona, electric discharge
- Discharges, electric/
  - glows
  - high frequency
- Gas-discharge tubes
- Lightning
- Sparks, electric
- Sputtering

14.50 MECHANICS OF GASES

- Acoustic streaming
- Aerodynamics
- Anemometers
- Compressibility/
  - gases
- Condensation
- Density/
  - gases
- Diffusion in gases/
  - thermal
- Flow/
  - gases
  - two-phase
- Flowmeters
- Gases
- Humidity
- Hygrometers
- Jets
- Manometers
- Moisture
- Pressure
- Pumps
- Radiation pressure
- Supersonic flow
- Turbulence
- Viscometers
- Viscosity/
  - gases
- Vortices
- Waves

14.60 GASEOUS STATE

- Absorption/
  - acoustic waves
  - acoustic waves, ultrasonic
  - electromagnetic waves
  - light
- Association/
  - gases
- Breakdown, electric/
  - gases
- Conductivity, electrical/
  - gases
  - measurement
- Conductivity, thermal/
  - gases
  - measurement
- Dielectric properties of substances/
  - gases
- Diffraction/
  - acoustic waves
  - acoustic waves, ultrasonic
  - electromagnetic waves
  - light
- Diffusion/
  - acoustic waves
  - electromagnetic waves
  - light
- Electrical properties of substances
- Electroluminescence
- Equations of state/
  - gases
- Gases
- Helium/
  - gas
- Interference/
  - acoustic waves
- Joule-Thomson effect
- Kinetic theory/
  - gases
- Lasers/
  - gaseous
- Luminescence/
  - gases
- Magnetic resonance and relaxation
- Molecules/
  - intermolecular mechanics
- Nuclear magnetic resonance and relaxation
- Nuclear quadrupole resonance
- Optical properties of substances
- Paramagnetic resonance and relaxation
- Reflection/
  - acoustic waves
  - acoustic waves, ultrasonic
  - electromagnetic waves
  - light
- Refraction/
  - acoustic waves
  - acoustic waves, ultrasonic
  - electromagnetic waves
  - light
- Scattering/
  - acoustic waves
  - acoustic waves, ultrasonic
  - electromagnetic waves
  - light
- Sorption
- Specific heat/
  - gases
- Spectra
- Statistical mechanics
- Thermoluminescence
- Transmission/
  - acoustic waves
  - acoustic waves, ultrasonic
  - light
- Velocity/
  - acoustic waves
  - acoustic waves, ultrasonic

14.65 Viscosity and Diffusion of Gases

- Diffusion in gases/
  - thermal
- Transport processes
- Viscosity/
  - gases

14.70 MECHANICS OF LIQUIDS

- Acoustic streaming
- Bubbles
- Capillarity
- Cavitation
- Compressibility/
  - liquids
- Density/
  - liquids
- Diffusion in liquids
  - thermal
- Double refraction/
  - flow
- Drops
- Elasticity/
  - liquids
- Emulsions
- Films/
  - liquid
- Filters
- Flow/
  - liquids
  - two-phase
- Flowmeters
- Foams
- Hydrodynamics
- Hydrostatics
- Jets
- Liquid oscillations
- Liquid waves/
  - surface
- Lubrication
- Moisture
- Pressure
- Pumps
- Radiation pressure
- Rheology
- Schlieren systems
- Sprays
- Surface energy
- Surface tension
- Surface tension measurement
- Thixotropy
- Turbulence
- Viscometers
- Viscosity/
  - liquids
- Vortices
- Wetting

14.80 LIQUID STATE

- Liquids
- Liquid metals

14.82 Theory and Structure of Liquids and Solutions

- Association/
  - liquids
- Electron diffraction examination of materials
- Equations of state/
  - liquids
- Films/
  - liquid
- Heat of solution
- Liquid crystals
- Liquids/
  - structure
  - theory
- Neutron diffraction examination of materials
- Neutrons and antineutrons/
  - scattering
- Polymers
- Solubility
- Solutions
- X-ray examination of materials/
  - liquids

14.83 Viscosity, Surface tension and Diffusion

- Diffusion in liquids/
  - thermal
- Filters
- Membranes
- Osmosis
- Sorption
- Surface tension
- Surface tension measurement
- Transport processes
- Viscosity/
  - liquids

14.85 Thermal properties of Liquids

- Conductivity, thermal/
  - liquids
  - measurement
- Heat of solution
- Specific heat/
  - liquids
- Thermal expansion
- Thermodynamic properties

14.86 Acoustical Properties of Liquids

- Absorption/
  - acoustic waves
  - acoustic waves, ultrasonic
- Acoustic wave propagation/
  - ultrasonic
- Diffraction/
  - acoustic waves
  - acoustic waves, ultrasonic
- Diffusion/
  - acoustic waves
- Interference/
  - acoustic waves
- Reflection/
  - acoustic waves
  - acoustic waves, ultrasonic
- Refraction/
  - acoustic waves
  - acoustic waves, ultrasonic
- Scattering/
  - acoustic waves
  - acoustic waves, ultrasonic
- Transmission/
  - acoustic waves
  - acoustic waves, ultrasonic
- Velocity/
  - acoustic waves
  - acoustic waves, ultrasonic

14.87 Optical Properties of Liquids

- Absorption/
  - electromagnetic waves
  - light
- Chemical shift
- Diffraction/
  - electromagnetic waves
  - light
- Diffusion/
  - electromagnetic waves
  - light
- Double refraction
  - flow
- Electroluminescence
- Luminescence/
  - liquids and solutions
- Optical pumping
- Optical properties of substs.
- Reflection/
  - electromagnetic waves
  - light
- Refraction/
  - electromagnetic waves
  - light
- Scattering/
  - electromagnetic waves
  - light
  - light, Brillouin spectra
  - light, Raman spectra
  - light, Raman spectra, inorganic
  - light, Raman spectra, organic
- Spectra/
  - inorganic liquids and solutions
- Thermoluminescence
- Transmission/
  - light

14.88 Electrical and Magnetic properties of Liquids

- Absorption/
  - electromagnetic waves
- Breakdown, electric/
  - liquids
- Conductivity, electrical/
  - liquids
  - liquids, electrolytic
  - measurement
- Dielectric properties of substs./
  - liquids and solutions
- Electrical properties of substs.
- Ionization, liquids
- Liquid metals
- Magnetic properties of substs.
- Magnetic resonance and relaxation
- Metals
- Nuclear magnetic resonance and relaxation
- Nuclear quadrupole resonance
- Paramagnetic resonance and relaxation
- Semiconducting materials
- Semiconductors

14.90 DISPERSIONS AND COLLOIDS

Aerosols
Centrifuges
Colloids
Disperse systems
Electrophoresis
Emulsions
Filters
Foams
Gels
Heat of solution
Membranes
Osmosis
Particle size
Precipitation
Sedimentation
Sols
Solubility
Solutions
Surface phenomena
Suspensions
Thixotropy

14.95 LIQUID HELIUM

Helium/
  liquid
  liquid, sound propagation
  solid
Quantum fluids/
  boson systems
  fermion systems

15.00 CHANGE OF STATE

Boiling
Boiling point
Condensation
Critical constants, thermal
Distillation
Drying
Equations of state
  gases
  liquids
  solids
Evaporation
Freezing
Heat of fusion
Heat of sublimation
Heat of transformation
Heat of vaporization
Humidity
Liquefaction, gases
Melting
Melting point
Phase equilibrium
Phase transformations
Sublimation
Supercooling
Vapour pressure
Vapour pressure measurement
Vaporization

16.00 SOLID STATE STRUCTURE AND MECHANICAL PROPERTIES

Crystal properties
Equations of state/
  solids
Solids/
  structure
  theory

16.10 NON-CRYSTALLINE STATE

Amorphous state
Glass
Plastics
Polymers
Rubber
Vitreous state
Waxes

16.20 SURFACE AND INTERFACE PHENOMENA

Surface energy
Surface measurement
Surface phenomena
Surface structure

16.23 Films

Crystals/
  growth
Epitaxy
Evaporation
Films, solid/
  electrical properties
  magnetic properties
  optical properties
Sputtering
Sublimation

16.25 Adsorption

Adsorbed layers
Adsorption
Heat of adsorption
Sorption

16.30 CRYSTALLOGRAPHY

Bonds
Charge compensation
Crystal chemistry
Crystal properties
Crystallography
Crystals/
  etching
  faces
  orientation
  twinning
Isomorphism
Minerals
Polymorphism
Solids/
  structure
Surface structure

16.33 Crystal growth

Crystallization
Crystals/
  growth
  whiskers
Epitaxy
Zone melting and refining

16.35 Crystal Structures, Techniques and Apparatus

- Alloys
- Amorphous state
- Crystal structure/
  - microstructure
- Crystal structure, atomic/
  - alloys
  - elements
  - inorganic compounds
  - organic compounds
- Density/
  - solids
- Electron diffraction crystallography
- Electron diffraction examination of materials
- Electron microscope examination of materials
- Electron microscopy
- Fibres
- Granular structure
- Ion microscopes
- Metallurgy
- Microscopy
- Neutron diffraction crystallography
- Neutron diffraction examination of materials
- Particle size
- Polymers
- Porous materials
- Powders
- Radiography
- Surface structure
- X-ray absorption
- X-ray crystallography/
  - apparatus
  - calculation apparatus
  - calculation methods
  - technique
- X-ray diffraction
- X-ray examination of materials
  - microstructure
  - molecular structure
- X-ray measurement
- X-ray monochromators
- X-ray reflection
- X-ray scattering
- X-ray tubes

16.40 DEFECT PROPERTIES OF SOLIDS

- Cold working
- Creep
- Crystal imperfections
  - dislocations
  - impurities
  - interstitials
  - vacancies
- Crystal structure
- Crystals
  - etching
  - twinning
- Deformation
- Elastic deformation
- Electron diffraction examination of materials
- Electron microscope examination of materials
- Heat treatment
  - alloys
- Internal friction
- Neutron diffraction examination of materials
- Plastic deformation
- Plastic flow
- Slip
- Stresses, internal
- Work hardening
- X-ray examination of materials/
  - microstructure

16.45 Colour centres

- Absorption/
  - light
- Colour centres
- X-rays/
  - effects

16.50 DIFFUSION IN SOLIDS

- Diffusion in solids/
  - thermal
- Permeability, mechanical

16.60 MECHANICAL PROPERTIES OF SOLIDS

- Abrasion
- Bending
- Brittleness
- Compressibility
- Cracks
- Creep
- Deformation
- Density/
  - solids
- Elastic constants/
  - measurement
- Elastic deformation
- Elastic fatigue
- Elastic limit
- Elastic relaxation
- Elasticity
- Fracture
- Friction
- Hardness
- High-pressure phenomena and effects
- Hysteresis
- Impact
- Internal friction
- Lubrication
- Magnetoelastic waves
- Magnetomechanical effects
- Mechanical properties of substances
- Mechanical strength/
  - compressive
  - shear
  - tensile
- Photoelasticity
- Plastic deformation
- Plastic flow
- Plasticity
- Rheology
- Slip
- Strain gauges
- Stress analysis
- Stress effects
- Stress/strain relations
- Stresses, internal
- Thermoelasticity
- Thixotropy
- Torsion
- Viscoelasticity
- Wear

16.65 Metallurgy. Phase transformations

- Adhesion
- Ageing
- Alloys
- Cold working
- Corrosion
- Forming processes
- Heat treatment/
  - alloys
- Metallurgy
- Phase equilibrium
- Phase transformations/
  - solid-state
- Physical effects of radiations
- Polymorphism
- Powders
- Precipitation
- Sintering
- Solid solutions
- Solubility
- Work hardening

16.70 LATTICE MECHANICS

- Crystals/
  - lattice mechanics
- Mössbauer effect

16.80 ACOUSTICAL PROPERTIES OF SOLIDS

- Absorption/
  - acoustic waves
  - acoustic waves, ultrasonic
- Acoustic wave propagation/
  - ultrasonic
- Acoustoelectric effects
- Acousto-optical effects
- Diffraction/
  - acoustic waves
  - acoustic waves, ultrasonic
- Dispersion, acoustic/
  - ultrasonic
- Magnetoacoustic effects
- Reflection/
  - acoustic waves
  - acoustic waves, ultrasonic
- Refraction/
  - acoustic waves
  - acoustic waves, ultrasonic
- Scattering/
  - acoustic waves
  - acoustic waves, ultrasonic
- Transducers
- Transmission/
  - acoustic waves
  - acoustic waves, ultrasonic
- Velocity/
  - acoustic waves
  - acoustic waves, ultrasonic

16.90 THERMAL PROPERTIES OF SOLIDS

- Conductivity thermal/
  - measurement
  - solids
- Equations of state/
  - solids
- Heat conduction
- Specific heat/
  - solids
- Thermal expansion
- Thermodynamic properties

16.95 RADIATION INTERACTION WITH SOLIDS

- Acoustic waves/
  - effects
- Alpha-particles/
  - effects
- Beta-rays/
  - effects
- Deuterons/
  - effects
- Electron beams/
  - effects
- Energy loss of particles
- Gamma-rays/
  - effects
- Hyperons/
  - effects
- Ion beams/
  - effects
- Mesons/
  - effects
- Neutrons and antineutrons/
  - effects
- Physical effects of radiations
- Protons and antiprotons/
  - effects
- Sputtering
- X-rays/
  - effects

17.00 SOLID STATE ELECTRICAL AND MAGNETIC PROPERTIES

- Crystals/
  - internal fields

17.10 ELECTRON STATES IN SOLIDS

- Crystal electron states
  - band structure
  - excitons
  - Fermi level
  - Fermi surface
  - impurity states and effects
  - plasma
  - polarons
  - surface
  - transport processes
- Crystal properties
- Cyclotron resonance
- de Haas-van Alphen effect
- Electron beams/
  - effects
- Electron gas
- Electron pairs/
  - annihilation
- Electrons
  - absorption
  - radiation
  - scattering
- Hall effect
- Kondo effect
- Magnetoacoustic effects
- Magnetoresistance
- Metals/
  - theory
- Piezoresistance
- Skin effect
- Solids/
  - theory
- Surface phenomena

17.20 ELECTRICAL PROPERTIES OF SOLIDS

- Acoustoelectric effects
- Conductivity, electrical/
  - measurement
  - solids
- Contacts, electrical
- Crystal electron states
- Eddy-currents
- Electrical properties of substs.
- Electron gas
- Electro-optical effects
- Films, solid/
  - electrical properties
- Fluctuations
- Hall effect
- Magnetoelectric effects
- Magnetoresistance
- Magnetothermal effects
- Noise, electrical
- Piezoelectricity
- Piezoresistance
- Space charge

17.22 Metallic Conducting Properties

- Electron gas
- Hall effect
- Magnetoelectric effects
- Magnetoresistance
- Metals/
  - theory
- Piezoresistance
- Semimetals
- Skin effect

17.24 Superconducting Properties

- Storage devices
- Superconducting devices
- Superconducting magnets
- Superconducting materials/
  - lead
  - niobium
- Superconductivity/
  - type II

17.26 Semiconducting Properties

- Acoustoelectric effects
- Contacts, electrical
- Electron gas
- Electro-optical effects
- Fluctuations
- Gunn effect
- Hall effect
- Magnetoelectric effects
- Magnetoresistance
- Magnetothermal effects
- Noise, electrical
- Piezoelectricity
- Piezoresistance
- Semiconductors
- Space charge
- Semiconducting materials/
  - gallium arsenide
  - germanium
  - indium antimonide
  - silicon

17.28 Semiconductor and Interface devices

- Gunn effect
- Microwave techniques and devices
- Rectifiers
- Semiconductor devices/
  - diodes
  - junctions
  - transistors
  - tunnel and interface devices
- Storage devices

17.29 Dielectric Properties

- Breakdown, electric/
  - solids
- Contacts, electrical
- Dielectric devices
- Dielectric measurement
- Dielectric phenomena
- Dielectric properties of substs./
  - solids
- Electrets
- Electric charge
- Electric fields
- Electric strength
- Electrostriction
- Ferroelectric materials/
  - barium titanate
- Ferroelectric phenomena
- Hysteresis
- Ionic conduction, solids
- Piezoelectric oscillations
- Piezoelectricity
- Pyroelectricity
- Relaxation
- Rochelle salt
- Space charge/
  - solid
- Triboelectricity

17.40 THERMOELECTROMAGNETIC PROPERTIES

- Magnetoelectric effects
- Magnetothermal effects
- Thermocouples
- Thermoelectricity

17.50 PHOTOELECTRIC PROPERTIES

- Photoconducting devices
- Photoconductivity
- Photoelectricity
- Photoelectromagnetic effects
- Photovoltaic effects

17.52 ELECTRON AND ION EMISSION BY SOLIDS

- Cathodes/
  - oxide
- Electron emission
  - field emission
  - photoelectric
  - secondary
  - thermionic
- Ion emission/
  - secondary
  - thermionic
- Ionization/
  - solids
- Ionization, surface
- Work function

17.60 MAGNETIC PROPERTIES OF SOLIDS

- Antiferromagnetism
- de Haas-van Alphen effect
- Diamagnetism
- Electron diffraction examination of materials
- Electron microscope examination of materials
- Exchange interactions
- Ferrimagnetism
- Ferrites
- Ferromagnetism/
  - spin-wave theory
- Films, solid/
  - magnetic properties
- Gyromagnetic ratio
- Hall effect
- Hysteresis
- Kondo effect
- Magnetic devices
- Magnetic fields/
  - effects
- Magnetic properties of dissolved atoms in dilute alloys
- Magnetic properties of substs.
  - antiferromagnetic
  - diamagnetic
  - ferrimagnetic
  - ferromagnetic
  - paramagnetic
  - transitions
- Magnetism
- Magnetization process
- Magnetization state/
  - domains
- Magnetoacoustic effects
- Magnetoelastic waves
- Magnetoelectric effects
- Magneto-optical effects
- Magnetoresistance
- Magnetostriction
- Magnetothermal effects
- Neutron diffraction examination of materials
- Paramagnetism
- Zeeman effect

17.62 Paramagnetic Properties

- Magnetic properties of substances/
  - paramagnetic
- Paramagnetism

17.64 Ferromagnetic Properties

- Exchange interactions
- Ferromagnetism/
  - spin-wave theory
- Films, solid/
  - magnetic properties
- Hysteresis
- Magnetic devices
- Magnetic properties of substances/
  - ferromagnetic
- Magnetization process
- Magnetization state/
  - domains
- Storage devices

17.66 Ferrimagnetic Properties. Ferrites

- Exchange interactions
- Ferrimagnetism
- Ferrites
- Hysteresis
- Magnetic devices
- Films, solid/
  - magnetic properties
- Magnetic properties of substances/
  - ferrimagnetic
- Storage devices

17.68 Antiferromagnetic Properties

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SUBSTANCES

Chemical elements and inorganic compounds

All the chemical elements are listed by name, followed by their compounds, e.g. "Cadmium, "Cadmium compounds".

"Hydrogen" is subdivided by the subheadings "neutral atoms", "neutral molecules" and "ions". "Deuterium" and "Tritium" are independent headings. "Hydrogen compounds" is supplemented by "Ice", "Steam" and "Water".

"Oxygen" is supplemented by "Ozone" and "Carbon" is supplemented by "Diamonds" and "Graphite"

The following inorganic compounds are further subdivided by subheadings as shown:-

- Barium compounds/
  - barium titanate*
- Cadmium compounds/
  - cadmium sulphide
- Calcium compounds/
  - calcium fluoride
- Gallium compounds/
  - gallium arsenide†
- Indium compounds/
  - indium antimonide†
- Lithium compounds/
  - lithium fluoride
- Nitrogen compounds/
  - ammonia
  - ammonium compounds
- Potassium compounds/
  - potassium bromide
  - potassium chloride
- Sodium compounds/
  - sodium chloride
- Zinc compounds/
  - zinc sulphide

* Ferroelectric properties are listed under "Ferroelectric materials/barium titanate"

† Semiconducting properties are listed under the corresponding subheadings of "Semiconducting materials"

Organic compounds

Organic compounds are grouped under headings "Organic compounds", "Polymers", "Plastics", Proteins". "Rochelle salt" is an independent heading.

Co-ordination compounds

Metallic co-ordination compounds are regarded as inorganic with a few exceptions and are indexed under the appropriate metallic compound heading, (not under organic compounds) e.g. Ni complex, bis (dimethylglyoximato) nickel (II) under Nickel compounds.

Substance groups

In addition there are the following headings for groups of elements, compounds or substances:-

- Actinides
- Actinide compounds
- Alkali metals
- Alkali-metal compounds/
  - halides
- Alkaline-earth metals
- Alkaline-earth compounds
- Ferrites
- Ferroelectric materials/
  - barium titanate‡
- Garnets
- Halogens
- Inert gases
- Metals
- Minerals
- Rare-earth metals
- Rare-earth compounds
- Semiconductors
- Semiconducting materials/
  - gallium arsenide§
  - germanium§
  - indium antimonide§
  - silicon§
- Superconducting materials/
  - lead‖
  - niobium‖
- Transition metals
- Transition-metal compounds

‡ Used for ferroelectric properties only

§ Used for semiconducting properties only

‖ Used for superconducting properties only

Alloys

General papers on alloys are indexed under "Alloys". Alloys of specified composition are listed under, either

(i) special alloy headings (there are five of them: "Aluminium alloys", "Copper alloys", "Iron alloys", "Nickel alloys", "Steel"), e.g. Al-Ni alloys under "Aluminium alloys", and "Nickel alloys".

(ii) compounds of the named elements, e.g. Mn-Zn alloys under "Manganese compounds" and "Zinc compounds". Silicon-iron under "Iron alloys" and "Silicon compounds".

Special substances and materials

There are also the following special headings for certain common substances:-

- Air
- Blood
- Ceramics
- Clay
- Coal
- Concrete
- Fibres
- Gelatin
- Glass
- Mica
- Optical materials
- Paper
- Porous materials
- Powders
- Quartz
- Rubber
- Ruby
- Sand
- Seawater
- Soil
- Waxes
- Wood

NOTICE TO READERS

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Grey atmosphere *see Radiative transfer; Stars/radiation*

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